PROOF OF THE IDENTITY OF PHOMA AND PHYLLOSTICTA ON THE SUGAR BEET.

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It has been asserted repeatedly during the past decade by leading phyto-pathologists of Europe that the Phyllosticta leaf blight and the Phoma root rot of the sugar beet were caused by the same fungus, but no cultural proof accompanied by inoculations has been made to establish the assumption. In order to ascertain the truth or falsity of such assertions, and also to try to discover if these imperfect fungi do not have perfect forms in their life cycle, an investigation was begun three years ago and continued intermittently till the present.

A large number of cultures have been made from sugar beets decaying with the typical black crown rot caused by Phoma, and from the peculiar concentric brown leaf spots produced by Phyllosticta upon the leaves of this plant. Pure cultures were isolated and grown under similar conditions both in test tubes and in Petrie dishes upon various agar and gelatin media and upon a number of vegetables. In all about fifty sets of cultures have been made. Although some variation of cultural characters was noted upon different media and under different physical conditions, the cultures from the two sources were similar when grown under the same conditions showing no distinct variation of the mycological characters, such as the color, dimension, and gross appearance of the spores, pycnidia and mycelium.

For the purpose of more certainly proving the identity of the two fungi, sugar beet plants were grown in the green house as follows for the purposes of inoculation. Sugar beet seeds were sterilized by placing them in concentrate sulphuric acid for thirty minutes then washing them thoroughly in sterile water and neutralizing the acid remaining in the seed coat by adding a ten per cent. solution of potassium hydroxide for a few minutes, then again washing in sterile water. These seeds were then placed in pots of soil which had been sterilized by heating to 100 degrees Centigrade for three hours upon three successive days. The plants from these seeds were grown in the greenhouse partly in the open and partly in a closed case. They were apparently free from either leaf blight or root rot fungi. Twelve plants were inoculated with Phoma and twelve with Phyllosticta, a similar number being used as a control. Similar leaf spots appeared in about three weeks upon both sets of inoculated plants, the control plants remaining free from disease. From both sets, leaf spots bearing mature pycnidia were taken and the fungus was isolated again and grown in pure cultures with the same results as before.

Beets whose roots were sound and healthy but whose leaves were diseased by Phyllosticta: were placed during December,

1901, in a moist silo, and at the same time others were put in a dry cellar, those in the latter being examined from time to time. The basal portions of the petioles of the diseased leaves were left attached to the crown of each beet. In a month or so the petioles had been partially or wholly rotted by the Phyllosticta and in two months the decay had penetrated the crowns of the beets producing the typical Phoma rot. Cultures carefully removed with a hot scalpel from the interior portions of the diseased tissues of the petioles and roots developed cultures of Phoma.

In the study of cultures of the fungus from both leaves and roots, under certain conditions there were produced guttulated spores, but normally in either case the spores were free from either guttules or oil globules. This work indicates that in the case of the beet we have only one species of fungus which according to priority of generic names will be placed in the genus Phoma, and that the various species of Phoma and Phyllostica described upon sugar beets, garden beets and mangels are identical. A synonymy of names will be published later.

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NOTE ON THE GENUS HARPOCHYTRIUM.

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At the suggestion of the editor I have prepared this short note on the genus HARPOCHYTRIUM for the JOURNAL OF MYCOLOGY — for the purpose of calling the attention of American students to these interesting Chytrids, to give brief characters of the genus, and the at present three species. I have also added a brief suggestion or two not brought out in my monographic treatment of the genus.[1]

In that paper I have described the development, formation of sporangia, formation and movement of zoospores, attachment to host, parasitism, relationship of forms, origin and distribution of species, and synonymy.

The genus is one of the *Chytridiales* and is probably best located in the family *Rhizidiaceae.* The plant body is elongated, narrowly fusiform, usually tapering to a point at the free end, but often more or less rounded at the basal end. Some of the individuals are straight but more often they are curved, sometimes strongly so. The plant is either sessile or attached to the host by a very short, slender stalk, or by a more or less elongated

[1] The Genus Harpochytrium in the United States, Ann. Mycol. 1: 479-502, Pl. 10 and text Figures A-F, November 1903. [Ausgegeben am 10. December 1903.]